IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Thomas KEMP
U.S. Serial No.:	Filed Concurrently Herewith
Title of Invention:	METHOD FOR RECOGNIZING SPEECH WITH NOISE-DEPENDENT VARIANCE NORMALIZATION

745 Fifth Avenue
New York, NY 10151

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Charles Jackson
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Chris Jackson
(Signature of person mailing paper or fee)

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Box Patent Application (35 U.S.C. 111)
Washington, D.C. 20231

Sir:

Before the issuance of the first Office Action, please amend the above-identified application as follows:

IN THE CLAIMS:

Please amend claims 3-5, 7-9 and 11-13 as follows:

3. (Amended) Method according to claim 1,

wherein said evaluation data (ED) and/or said normalization data (ND) are generated so as to reflect at least a piecewise frequency dependency.

4. (Amended) Method according to claim 1,

wherein said statistical analysis (S11) includes a step of determining signal-to-noise ratio data (SNR) or the like, in particular in a frequency-dependent manner.

5. (Amended) Method according to claim 1,

wherein a set of discrete normalization degree values (Dj) is used as said normalization degree data (ND), in particular each of which being assigned to a certain frequency interval (fj, Δfj), said intervals (fj, Δfj) having essentially no overlap.

7. (Amended) Method according to claim 1,

wherein in each case a normalization degree value (Dj) in the neighbourhood of 0 indicates to skip any variance normalization (VN) for the respective assigned frequency interval (fj, Δfj).

8. (Amended) Method according to claim 1,

wherein in each case a normalization degree value (Dj) in the neighbourhood of 1 indicates to perform a maximum variance normalization (VN) for the respective assigned frequency interval (fj, Δfj).

9. (Amended) Method according to claim 1,

wherein a transfer function between said statistical evaluation data (ED) and said normalization degree data (ND) is used for generating said normalization degree data (ND) from said statistical evaluation data (ED).

11. (Amended) Method according to claim 9,

wherein a theta-function, a sigmoidal function or the like is employed as said transfer function.

12. (Amended) Method according to claim 1,

wherein said variance normalization (S14) is carried out by multiplying said speech signal (S), a derivative (S') and/or a component thereof with a reduction factor (R) being a function of said statistical evaluation data (ED), in particular of the signal noise, and the normalization degree data (ND), in particular of the normalization degree values (Dj) and/or in particular in a frequency-dependent manner.

13. (Amended) Method according to claim 1,

wherein a reduction factor (R) is used having the - in particular frequency-dependent - form

$$R = 1/(1 + (\sigma - 1) \cdot D)$$

with σ denoting the temporal standard deviation of the speech signal (S), its derivative (S'), a component and/or a feature thereof and D denotes the normalization degree value in question.

REMARKS

Claims 1-13 remain in the application. Claims 3-5, 7-9 and 11-13 have been amended to eliminate multiple dependencies. Attached hereto is a marked up version of the changes made to the claims 3-5, 7-9 and 11-13 by the current amendment. The attached page is captioned **"Version with markings to show changes made."** The filing fee has been calculated based upon these amendments to the claims.

Respectfully submitted,

FROMMER LAWRENCE & HAUG LLP
Attorneys for Applicant

By: William S. Frommer
Reg. No. 25,506
Tel. (212) 588-0800

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the claims:

3. (Amended) Method according to claim 1 ~~anyone of the preceding claims~~, wherein said evaluation data (ED) and/or said normalization data (ND) are generated so as to reflect at least a piecewise frequency dependency.

4. (Amended) Method according to claim 1 ~~anyone of the preceding claims~~, wherein said statistical analysis (S11) includes a step of determining signal-to-noise ratio data (SNR) or the like, in particular in a frequency-dependent manner.

5. (Amended) Method according to claim 1 ~~anyone of the preceding claims~~, wherein a set of discrete normalization degree values (Dj) is used as said normalization degree data (ND), in particular each of which being assigned to a certain frequency interval (fj, Δfj), said intervals (fj, Δfj) having essentially no overlap.

7. (Amended) Method according to claim 1 ~~anyone of the preceding claims~~, wherein in each case a normalization degree value (Dj) in the neighbourhood of 0 indicates to skip any variance normalization (VN) for the respective assigned frequency interval (fj, Δfj).

8. (Amended) Method according to claim 1 ~~anyone of the preceding claims~~, wherein in each case a normalization degree value (Dj) in the neighbourhood of 1 indicates to perform a maximum variance normalization (VN) for the respective assigned frequency interval (fj, Δfj).

9. (Amended) Method according to claim 1 ~~anyone of the preceding claims~~,

wherein a transfer function between said statistical evaluation data (ED) and said normalization degree data (ND) is used for generating said normalization degree data (ND) from said statistical evaluation data (ED).

11. (Amended) Method according to claim 9 ~~anyone of claims 9 or 10~~,

wherein a theta-function, a sigmoidal function or the like is employed as said transfer function.

12. (Amended) Method according to claim 1 ~~anyone of the preceding claims~~,

wherein said variance normalization (S14) is carried out by multiplying said speech signal (S), a derivative (S') and/or a component thereof with a reduction factor (R) being a function of said statistical evaluation data (ED), in particular of the signal noise, and the normalization degree data (ND), in particular of the normalization degree values (Dj) and/or in particular in a frequency-dependent manner.

13. (Amended) Method according to claim 1 ~~anyone of the preceding claims~~,

wherein a reduction factor (R) is used having the - in particular frequency-dependent - form

$$R = 1/(1 + (\sigma - 1) \cdot D)$$

with σ denoting the temporal standard deviation of the speech signal (S), its derivative (S'), a component and/or a feature thereof and D denotes the normalization degree value in question.